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ABSTRACT

This study examined the feasibility of one method of investigating the development of children's implicit awareness of syntactic patterns. An enriched version of the free association format was used to test 32 subjects. The principal variables of interest were the subject's grade level, and the syntactic pattern and meaningfulness of the semantic relationship between words in each stimulus pair. Kindergarten, second, fourth and sixth grade boys and girls were individually tested on single words and on meaningfully and meaninglessly related pairs. Results indicated a strong developmental trend in children's tendency to match the syntactic pattern of the 2-word stimulus. This tendency appeared to be sensitive to variations in syntactic and semantic relationships within the stimulus pairs. (GO)

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Children's Free Associations to Single Words and to Meaningfully and Meaninglessly Related Pairs

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A large number of studies, notably those by Ervin (1961), Entwisle (1966), and Palermo & Jenkins (1966), have indicated that children's free associations to single-word stimuli show an increasing tendency for the response to match the grammatical category of the stimulus. A child of age five, given the stimulus "pretty" may respond "flower," which is termed a syntagmatic response in that "pretty flower" forms a sentence-like pattern. A child of eight or nine given the same stimulus is likely to respond "ugly" or "beautiful," which would be termed paradigmatic responses in that the response matches the grammatical paradigm of the stimulus. The typical age of the shift from syntagmatic to paradigmatic responses varies somewhat with the grammatical form --nouns, for example are matched relatively early, adverbs relatively late. The central thrust of such studies is that during the elementary years children show an increasing tendency to indicate in their responses an implicit awareness of grammatical form.

Although studies using relatively controlled experimental forms such as free associations, free recall, proactive inhibition, etc., have enriched our knowledge of certain aspects of verbal behavior, there are some who ask "What has that to do with language?" By language, they mean the ongoing, complexly determined structural arrangement of sentence elements, which seldom consists of words in isolation. The study of childre..'s expressive use of syntax hardly becomes interesting until they begin to put two or three words together. The observational studies of children's acquisition of syntax, however, have certain disadvantages -- the rich context in which children's utterances are embedded is quite difficult to control or even to specify, and the probability of a given

response is perhaps conditioned by many factors other than availability of a given syntactic concept.

The principal object of the present study was to determine whether it is feasible to study development of implicit awareness of syntactic patterns by employing an enriched version of the free association format. Since the juxtaposition of two words forms a syntactic pattern, by employing pairs of words rather than single words as stimuli, we can tap awareness of syntactic patterns rather than the grammatical classes of individual words. For example, if in response to "happy baby" the child says "sad mother," he has matched the adjective - noun syntactic pattern. It is thus possible to examine developmental trends in the tendency to match the syntactic patterns of two-word stimuli and to determine whether certain syntactic patterns are more easily matched than others.

It is possible, however, that the child is responding primarily to semantic features such as mood-person for "happy baby," rather than to syntactic features. A number of studies have shown that children's responses to syntactic form may be strongly affected, at least during early stages of acquisition of a given form, by semantic factors. Hutson (1974, 1975), for example, has demonstrated that improbable passive sentences such as "The mother was washed by the baby" are more difficult for children to comprehend than are probable passive sentences such as "The baby was washed by the mother," even though the syntactic form is the same. In the context of the present study it was possible to vary semantic content, while keeping syntactic form constant, by presenting both meaningfully related word pairs such as "happy baby" and meaninglessly

related pairs such as "happy rock." It is not the meaningfulness of the individual words but the meaningfulness of the relationship of the words that is being varied. Although it is possible for individuals to add specifications or idiosyncratic associations to make almost anything meaningful, phrases such as "happy rock," "break sand," and "fork cries" are certainly stranger than the corresponding meaningful phrases "happy baby," "break sand," and "fork cuts."

In this study, then, the principal variables of interest were grade, syntactic pattern, and meaningfulness of the semantic relationship. It was expected that means for correct matches of syntactic pattern would increase by grade, and that means would be higher for meaningfully related pairs than for meaninglessly related pairs. Although it was expected that the various syntactic patterns would be of differential difficulty, and that semantic relationship would have its greatest impact during the early phases of development of awareness of a given syntactic pattern, it was not possible to specify in advance the order to difficulty.

METHOD

Subjects:

Thirty-two subjects were individually tested in each of four grades (kindergarten, second, fourth and sixth) with equal numbers of males and females at each grade. Subjects were randomly drawn from four parochial schools serving predominantly lower-middle class families in two medium-sized Northeastern cities.

Materials:

A pool of items was formed for each of four syntactic patterns -- noun-noun, noun-verb, adjective-noun, verb-noun After initial tryout, four

meaningfully related and corresponding unrelated pairs were selected for each syntactic pattern. One of the meaningfully related adjective-noun pairs, for example, was "happy baby," and the corresponding unrelated pair was "happy rock." (See Table 1)

Syntactic patterns were randomly assigned to position within the first and second half of each section of List A, and individual items were then randomly assigned to each of these slots. Within each half of a section of the list, items were randomly assigned to be presented in List A as meaningful or meaningless pairs. List B was formed from the meaningless versions of the meaningful items and the meaningful versions of the meaningless items used in List A.

Procedures:

Within each grade and sex, subjects were randomly assigned to individual testing on List A or List B, and to order of presentation. Single words were always given first, but half the subjects received the set of eight meaningful pairs before meaningless, and half the subjects heard the meaningless pairs before the meaningful.

Instructions:

For single-word items, "I'll say one word and you say one word, any word it makes you think of." For pairs, "I'll say two words this time, and you say two other words, any two you think of." If a subject gave more than or less than the number the words requested or repeated the stimulus words, he was reminded the first two times this occurred, but after that his answers were simply accepted.

Scoring:

Responses to the single-word stimuli were scored in terms of match of the grammatical class of stimulus and response, generally following

Ervin's (1961) scoring procedures.

Responses to pairs were scored in two ways. In order to analyze syntactic match on an individual word level, pairs of words were scored 1 if 1 word matched, or 2 if both words matched the syntactic categories of the stimulus pair, even if not in the same order. If neither word matched, or if both stimulus words were repeated, the response was scored 0; if 1 new word was combined with 1 repeated word (e.g., "candles burn" in response to "lights burn"), the non-repeated portion of the response was accepted and scored in terms of its syntactic match.[1]

The second scoring system rated match of the overall syntactic pattern -- a match on both word-classes, in correct order. Matches were scored 2, mismatches 0, for a total possible score of 16 on each type. For verb-noun pairs such as "eat bread," an answer such as "drink soup" would be scored 2, but "good bread" would be scored 0 because it follows another pattern (adjective-noun), although such a response would be scored as partially correct under the other scoring system.

Design:

For analysis of pattern-matches, the design was a 4 x 2 x 4 x 2 factorial (Grade x List x Syntactic Type x Semantic Relationship), with repeated measures on syntax and semantic. Tukey's a test was applied to significant effects.

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FOOTNOTES

1. (p. 5) Analysis of responses to single words and of word-match of responses to pairs is not presented in this report, but is available if specifically requested. There were no effects on pattern match for sex or order.

2. (p. 8) Another way of describing this interaction (which is of marginal significance) is to state that within each syntactic pattern, means for meaningfully related and meaninglessly related pairs were not significantly different. Within the responses to meaninglessly related pairs, the order of difficulty for syntactic pattern was the same as in the main effect for syntax (n-n > a-n > v-n > n-v). Within the responses to meaningfully related pairs the order of a-n and v-n was reversed, but these means were not significantly different.

TABLE 1

Items Used in Free Associates Task

Single Words	Meaningful Pairs			Meaningless Pairs		
	List A			List A		
dress	NN	car	truck	NN	hat	broom
in	NV	fork	cuts	NV	frogs	read
bake	AN	pretty	lady	AN	happy	rock
flowers	VN	eat	bread	VN	drive	shirt
ugly						
green						
under	NN	dog	cat	NN	chair	horse
stop	AN	large	bottle	AN	rotten	ice
	VN	break	bat	VN	drop	floor
	NV	lights	burn	NV	cow	claps
	List B			List B		
	VN	drive	car	VN	eat	sunshine
	AN	happy	baby	AN	pretty	milk
	NN	hat	head	NN	car	shoe
	NV	frogs	eat	NV	fork	cries
	VN	drop	plate	VN	break	sand
	AN	rotten	garbage	AN	large	air
	NN	chair	table	NN	dog	cloud
	NV	cow	eats	NV	lights	talk

TABLE 2

ANOVA for Pattern-Match Responses

Source	df	MS	F
Between	(127)		
Grade	3	57.276	18.915**
List	1	6.890	2.275
Grade x List	3	9.609	3.173*
Error 1	124	3.028	
Within	(902)		
Semantic Relatedness	1	1.563	1.133
Semantic x Grade	3	1.573	1.140
Semantic x List	1	.250	< 1
Semantic x Grade x List	3	.635	< 1
Error 2	120	1.380	
Syntactic Pattern	3	75.464	48.749**
Syntax x Grade	9	6.141	3.967**
Syntax x List	3	1.755	1.134
Syntax x Grade x List	9	3.293	2.127*
Error 3	360	1.548	
Semantic x Syntactic	3	6.573	5.795**
Semantic x Syntactic x Grade	9	1.181	1.041
Semantic x Syntactic x List	3	9.469	8.350**
Semantic x Syntactic x Grade x List	9	1.674	1.476
Error 4	360	1.134	
TOTAL	(1024)		

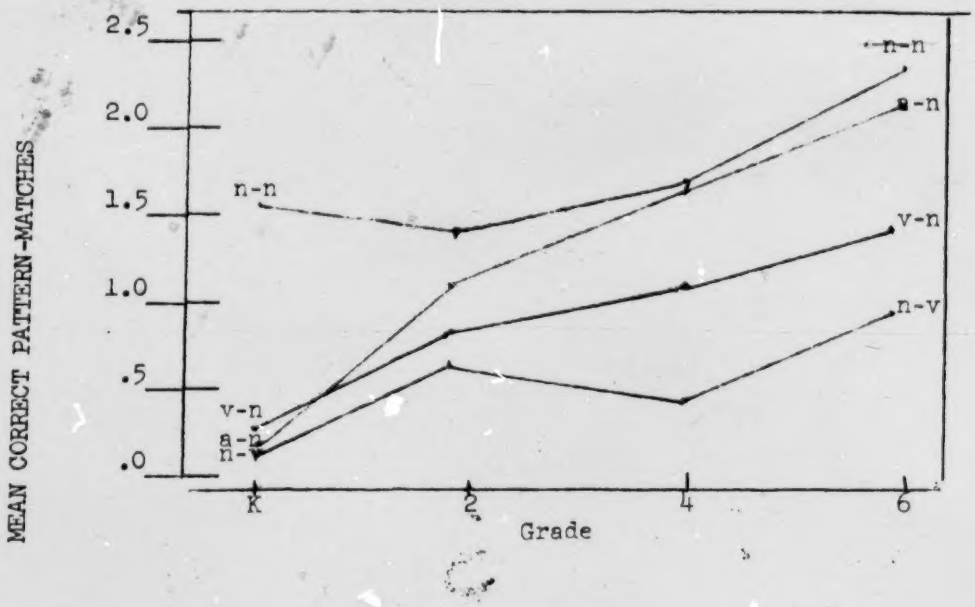
*p < .05, **p < .001

TABLE 3

Means for Pattern-Match of Pairs by Grade and Syntactic Pattern

Syntactic Pattern	Grade K	2	4	6	Total Pattern Mean
noun-noun	1.56	1.47	1.75	2.34	1.78
noun-verb	.19	.59	.47	.84	.52
verb-noun	.34	.81	1.06	1.41	.91
adjective-noun	.22	1.16	1.72	2.25	1.34
Total Grade Mean	.58	1.01	1.25	1.71	1.14

FIGURE 1



n-n = noun-noun

n-v = noun-verb

v-n = verb-noun

a-n = adjective-noun

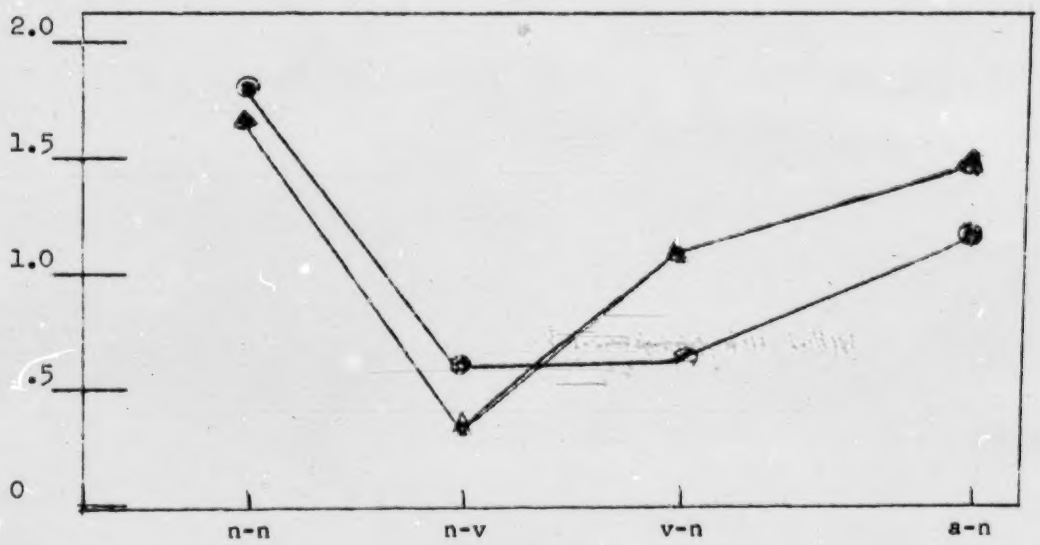
TABLE 4

Means for Pattern-Match of Pairs by Syntactic Pattern and Semantic Relatedness

Syntactic Pattern	Semantic Relatedness: Related	Unrelated	Total
noun-noun	1.70	1.86	1.78
noun-verb	.41	.64	.52
verb-noun	1.11	.70	.91
adjective-noun	1.48	1.19	1.34
Total	1.18	1.10	1.14

FIGURE 2

Mean Correct Pattern Matches



Syntactic Patterns

n-n = noun-noun

n-v = noun-verb

v-n = verb-noun

a-n = adjective-noun

_____ Meaningful

_____ Meaningless

TABLE 5

Means for Pattern-Match of Pairs by Grade and List

List	Grade				Total
	K	2	4	6	
A	.78	.81	1.34	1.94	1.22
B	.38	1.20	1.16	1.48	1.05
Total	.58	1.01	1.25	1.71	1.14

TABLE 6

Means for Pattern-Match by Semantic Relationship,

Syntactic Pattern and List

Syntactic Pattern	LIST A Meaningfully Related	LIST A Meaningless Related	LIST A Combined	LIST B Meaningfully Related	LIST B Meaningless Related	LIST B Combined	Total
noun-noun	2.06	1.34	1.76	1.81	1.90	1.85	1.78
noun-verb	.31	.72	.52	.50	.56	.53	.52
verb-noun	.94	.94	.94	1.28	.47	.88	.91
adjective-noun	1.78	1.19	1.48	1.19	1.19	1.19	1.34
Total	1.27	1.05	1.16	1.20	1.03	1.11	1.14

N=128, Maximum score = 4.00